Amendments to the Claims

1. (Currently amended) A carrier recovery device of a digital ~~TV~~ television (TV) receiver comprising:

an analog/digital (A/D) converter converting an analog signal to a digital signal by using a fixed frequency;

a phase splitter splitting the digital signal to a real signal and a quadrature signal;

a first complex multiplier outputting a real base band signal i(t) and a quadrature base band signal q(t) by performing a complex multiplying of the real and quadrature signals of ~~the~~ a split passband of the phase splitter and a first complex carrier outputted from a first numerically controlled oscillator (NCO);

a second complex multiplier outputting Like Offset Quadrature Amplitude Modulation (QAM) signals i'(t) and q'(t) by performing a complex multiplying of the real and quadrature base band signals i(t) and q(t) and a second complex carrier outputted from a second NCO;

first and second squarers receiving the Like Offset QAM signals i'(t) and q'(t), and performing a nonlinear operation;

a subtractor receiving output signals from the first and second squarers, and performing a subtraction operation;

a passband filter extracting components corresponding to a carrier frequency from the signals outputted from the subtractor;

a Gardner phase error detector detecting a phase error ~~to~~between the filtered signal of the passband filter and a particular multiple of a fixed frequency ~~on basis of the Like Offset QAM signals i'(t) and q'(t)~~; and

a ~~Loop~~ loop filter low-pass filtering the phase error, and outputting the filtered phase error to the first NCO.

2. (Currently amended) The carrier recovery device as claimed in claim 1, wherein the first complex carrier is ~~in~~ proportional to the filtered phase error outputted from the ~~Loop~~ loop filter.

3. (Original) The carrier recovery device as claimed in claim 1, wherein the second NCO generates a frequency of the same type as an Offset QAM signal without reception of a control signal from ~~the~~ an external.

4. (Original) The carrier recovery device as claimed in claim 1, wherein the Like Offset QAM signal is an output signal of the second complex multiplier wherein the fixed frequency is twice a symbol clock frequency.

5. (Original) The carrier recovery device as claimed in claim 1, wherein a pilot frequency of the Like Offset QAM signal is located in a frequency band corresponding to 1/8 of the fixed frequency.

6. (Canceled)

6 7. (Currently amended) The carrier recovery device as claimed in claim 61, wherein the first and second squarers respectively output a carrier signal component having a converted frequency corresponding to 1/4 of the fixed frequency, and a frequency of a signal in the periphery of the second carrier.

7 8. (Currently amended) ~~The device as claimed in claim 1, wherein the phase error detector includes:~~A carrier recovery device, comprising:

an analog/digital (A/D) converter converting an analog signal to a digital signal by using a fixed frequency;

a phase splitter splitting the digital signal to a real signal and a quadrature signal;

a first complex multiplier outputting a real base band signal i(t) and a quadrature base band signal q(t) by performing a complex multiplying of the real and quadrature signals of a ~~the~~ split passband of the phase splitter and a first complex carrier outputted from a first numerically controlled oscillator (NCO);

a second complex multiplier outputting Like Offset Quadrature Amplitude Modulation (QAM) signals i'(t) and q'(t) by performing a complex multiplying of the real and quadrature base band signals i(t) and q(t) and a second complex carrier outputted from a second NCO;

first and second absolute value calculators receiving the Like Offset QAM signals, i'(t) and q'(t), and calculating absolute values thereof;

a subtractor receiving outputs of the first and second absolute value calculators, and performing a subtraction operation;

a passband filter receiving the signals from the subtractor, and extracting components corresponding to a carrier frequency therefrom; ~~and~~

a Gardner phase error detector detecting a phase error between the filtered signal of the passband filter and a particular multiple of a ~~the~~ fixed frequency; and

loop
a ~~Loop~~ filter low-pass filtering the phase error, and outputting the filtered phase error to the first NCO.

carrier recovery 7
8 8. (Original) The device as claimed in claim 8, wherein the first and second absolute value calculators convert a ~~the~~ carrier signal component to have ~~and components in all data blocks in the periphery of the carrier signal component to have the~~ a frequency corresponding to 1/4 of the fixed frequency.

10. (Canceled)

carrier recovery 7
9 11. (Currently amended) The device as claimed in claim ~~10~~8, wherein the first complex carrier is ~~in~~ proportional to the phase error outputted from the Loop filter.

carrier recovery 7
10 12. (Currently amended) The device as claimed in claim ~~10~~8, wherein the second NCO generates a frequency of the same type as an Offset QAM signal without reception of a control signal from an ~~the~~ external.

13. (Canceled)

14. (Canceled)

15. (Canceled)

carrier recovery 7
11 16. (New) The device as claimed in claim 8, wherein the Like Offset QAM signal is an output signal of the second complex multiplier wherein ~~when~~ the fixed frequency is twice a symbol clock frequency.

carrier recovery 7
12 17. (New) The device as claimed in claim 8, wherein a pilot frequency of the Like Offset QAM signal is located in a frequency band corresponding to 1/8 of the fixed frequency.